Psychiatry, Psychology and Law, 2017
Vol. 24, No. 4, 561–575, http://dx.doi.org/10.1080/13218719.2016.1256019

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Violence Risk among Youth Referred to a Forensic Mental Health Service

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Youth who engage in serious aggressive, violent, or threatening behaviour pose a concern to others about their potential for future acts of violence. The current study investigates violence risk factors among young people referred to a child and youth forensic mental health service. The primary aim of this study is to examine the demographic, historical, and clinical characteristics of a sample of 91 young people in order to assess whether there are distinct groups or clusters that share common profiles. Using a two-step cluster analysis, three distinct clusters were found. Cluster 1 (generally non-violent, $n = 34$) comprises a subgroup with fewer family adversity factors and an absence of serious violence. Cluster 2 (early violence, $n = 35$) comprises a subgroup with serious violent histories, comorbid mental health disorders, and an early onset of behavioural difficulties. Cluster 3 (later violence, $n = 19$) includes young people with serious violent and antisocial histories, and a later onset of behavioural difficulties. The results of the study support the notion that youth referred for specialised violence risk assessments are a heterogeneous group with distinct individual differences. This has implications for determining the level of intervention and treatment required to reduce youth offending and violence.

Key words: cluster analysis; juvenile; mental health; targeted violence; violence risk factors.

Introduction

A significant proportion of young people in Australia come into contact with the youth justice system due to offending behaviour (Stewart, Allard, & Dennison, 2011). Statistics collected on patterns of offending and crime victimisation in Australian youth indicate that young people aged between 10 and 24 years are over-represented as offenders (Australian Bureau of Statistics, 2011). Furthermore, rates of offending in youth aged between 10 and 19 years have continued to increase since 2007 (Australian Bureau of Statistics, 2010), and rates of assault by juvenile offenders have increased by 48% over a 10-year period (Australian Institute of Criminology, 2009). Violence amongst youth has been depicted as an important public health issue, given the negative consequences on physical health, mental well-being, and mortality rates (Voukelatos & Mitchell, 2009).

Violence Risk Factors

Given the impact that threatening behaviour and violence can have on the young person, families, and the wider community, many researchers have been interested in the aetiology and risk factors associated with youth violence. Risk factors for youth violence include demographics, history, the family,

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social and contextual aspects, and mental health. Offending rates for violence increase with age, and it is quite rare for children younger than 10 years of age to commit violent crimes (Seifert, Kohl, Ray, & Schmidt, 2011). The age crime curve demonstrates that crime rates rise from early adolescence, with the peak age of onset between 8 and 14 years (Farrington, 1992). Gender differences have been found in the prevalence of violence (Moffitt & Caspi, 2001). Statistics in Australia show that the number of male offenders proceeded against by police is twice as many as the number of females, and that both offenders and victims of violence are more likely to be male (Sercombe, 2003). Cultural disparities have been identified with much higher rates of violence in Aboriginal communities than the national average (Australian Institute of Health and Welfare, 2011; Sercombe, 2003). The higher rate of offending by indigenous people in Australia has been attributed to multiple social, environmental, and cultural factors (Broadhurst, 1997).

Historical Factors

Research into the developmental trajectories of youth violence has identified a number of historical factors that are associated with later chronic violence. One of the strongest predictors of future violent behaviour includes an early onset of problematic behavioural difficulties such as aggression, delinquency, offending, substance use, and rule violations, particularly prior to the age of 14 years (Borum, 2000; Farrington, 1991, 1995; Mulder, Brand, Bullens, & Van Marle, 2010). Other historical factors associated with future violence include having previous violence and antisocial behaviour (Borum, 2006; Hemphill et al., 2009; Herrenkohl et al., 2000) and being exposed to violence through domestic violence or community violence (Kliewer et al., 2006; Rappaport & Thomas, 2004).

Moffitt (1993) identified two main groups of offenders in her developmental taxonomy. The first group is characterised by childhood onset of offending and persistence into adulthood, and has been termed *life course persistent offenders* (Moffitt, 1993), or *early starters* (Patterson, Capaldi, & Bank, 1991). This subtype has been associated with early behavioural difficulties, instability in the family, neuropsychological deficits, and persistence into adulthood (Moffitt, 2006; Moffitt & Caspi, 2001). The second group is characterised by a late onset of offending, and has been termed *adolescence limited offenders* (Moffitt, 1993) or *late starters* (Patterson et al., 1991). This subtype is typically bound to adolescence, has weaker correlations with negative family factors, and has been associated with negative social learning and antisocial peers (Moffitt, 2006; Moffitt & Caspi, 2001). The existence of these trajectories has not always been supported in the literature, with some studies revealing a different number of developmental pathways (Bushway, Thornberry, & Krohn, 2003; Hoeve et al., 2008; Lacourse et al., 2002), most likely reflecting methodological differences (Walters & Ruscio, 2013).

Family Factors

Family factors associated with youth violence include a history of antisocial behaviour (e.g. substance abuse and criminality), negative parenting styles, family conflict, and poor behaviour management (Herrenkohl et al., 2000; Mulder et al., 2010). Notably, an association has been found between early adversity and later perpetration of violence (Farrington, 1991; Stouthamer-Loeber, Loeber, Homish, & Wei, 2001; Zingraff, Leiter, Myers, & Johnson, 1993). Stouthamer-Loeber et al. (2001) found that youth who experience childhood maltreatment are more likely to get into physical fights, engage in non-index violent offences, and have later contact with the juvenile courts than non-maltreated youth. While research shows evidence

of an association between maltreatment in childhood and later violence, some research is inconclusive as to whether maltreatment is uniquely predictive of outcomes once demographics and other competing predictors are taken into account (Maas, Herrenkohl, & Sousa, 2008).

Social and Contextual Factors

A number of social and contextual factors are also associated with youth violence. During adolescence, antisocial peer relationships can have a strong influence on young people and their engagement in offending and violent behaviour (Borum, 2000; Hemphill et al., 2009; Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003). Recent research has examined the role of antisocial peers on youth violence and found that gang affiliation is related to greater involvement with antisocial peers, fewer interactions with pro-social peers, less commitment to school, and higher acceptance of and involvement in offending behaviour and violence (Melde & Esbensen, 2011). The association between substance use and violence is also well established. In a longitudinal study which took place over a 20-year period, drug use during early adolescence was associated with later delinquency in both adolescence and adulthood (Brook, Whiteman, Finch, & Cohen, 1996). Furthermore, youth with comorbid mental health disorders and substance use are at higher risk of violent offending than youth without comorbid disorders (Sullivan, Veysey, & Dorangrichia, 2003).

Mental Health Disorders

Higher rates of mental health disorders have been found in young offenders (Fazel, Doll, & Langstrom, 2008; Grisso, 2008; Teplin, Abram, McClelland, & Dulcan, 2002), with certain psychiatric diagnoses found to increase a young person's vulnerability to violence and aggression (Arseneault, Moffitt, Caspi, Taylor, & Silva, 2000; Connor, 2002). Recent research has revealed that over two thirds of juveniles who have been detained present with a psychiatric disorder (Fazel et al., 2008). In Australia, similar rates have been found, with research into youth in custody indicating that they experience elevated rates of substance abuse and mental health disorders (Bickel & Campbell, 2002; Sawyer et al., 2010; Stathis et al., 2008). Given the higher rates of traumatic exposure and childhood maltreatment amongst juvenile offenders, they are at a greater risk of suffering from post-traumatic stress disorder (PTSD) and developing other mental health disorders compared to non-offending youth (Ford, Elhai, Connor, & Frueh, 2010). This risk is greater in young people who have experienced multiple types of victimisation (Ford et al., 2010).

Research into the prevalence of pervasive developmental disorders (PDDs) in young people involved in the juvenile justice system is sparse, with limited systematic research published on this area (Mouridsen, 2012; Mouridsen, Rich, Isager, & Nedergaard, 2008). The majority of the studies involve small, unrepresentative clinical samples and case reports, limiting the generalisability of their results (Bjorkly, 2009; Mouridsen, 2012). A recent review on the relationship between PDDs and violence risk revealed few studies that support a stable association (Bjorkly, 2009). Some have suggested that violence committed by those with autism spectrum disorder (ASD) might be specific to factors related to the diagnosis, however further research is required (Bjorkly, 2009). The association between both conduct disorder and attention deficit hyperactivity disorder (ADHD) and youth violence is well documented. Youth who have conduct disorder as children are more likely to engage in aggressive behaviour and crime in adulthood, with increased rates of both non-violent and violent offending recorded (Fergusson, Horwood, & Ridder, 2005; Hodgins, Cree, Alderton, & Mak, 2008; Odgers et al., 2007). Research indicates that those with a diagnosis

of conduct disorder often have comorbid mental health disorders (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004; Rey, 1994; Rowe, Maughan, Costello, & Angold, 2005). Prevalence rates of ADHD in both youth detention and juvenile justice settings are much higher than those found in the community (Gordon & Moore, 2005; Retz et al., 2004; Rosler et al., 2004), and a correlation has been found between ADHD and later patterns of high-risk-taking, juvenile offending, and violent behaviour (Satterfield et al., 2007).

A number of studies have investigated the individual, historical, and social contextual factors associated with violence in youth. The relationship between different mental health diagnoses and violence has been the subject of recent research, suggesting that young people often present to mental health services with a combination of risk factors, complicating their presentation. While there is considerable research on this area, many studies are conducted in other countries – such as the United States – and therefore the findings may not generalise to other populations, such as Australian youth. The current study aims to address this limitation by investigating the clinical, social, and demographic characteristics of a sample of Australian youth aged 10 to 18 years who have been referred to a forensic mental health service for assessment of risk of violence. An evaluation of this population can assist in understanding the risk factors, and may improve the identification of at-risk youth in the future, thus increasing case management efficacy. This can also help to inform treatment planning, risk-management strategies, processes, and policies within child and youth forensic mental health contexts.

Developmental theories have proposed that there are different pathways towards developing antisocial behaviour (Moffitt, 1993). Given that young people who are referred to child and youth forensic mental health services exhibit a wide range of individual differences across a number of key demographic and clinical variables, it may be that there are distinct subgroups that share common profiles. The current research seeks to investigate the characteristics and potential clusters of youth who are referred for risk assessments, using an exploratory cluster analysis. It was anticipated that there would be different subgroups of young people referred for assessments. Classifying young people based on their risk profiles can have important implications on the types of treatment interventions and case management plans that are implemented when working with them. Based on the current literature on youth violence, it was hypothesised that:

(1) The sample would be a heterogeneous group consisting of several subgroups, each with distinct risk factors. Utilising cluster analysis, it was hypothesised that the following variables would distinguish these subgroups from each other: history of violence, history of antisocial behaviour, early behavioural difficulties, peer type (antisocial), family history of antisocial behaviour, mental health diagnoses, and history of trauma and abuse. In particular, it was expected that subgroups would differ in risk factors, and that young people with more of these factors would form a distinct group from those with limited risk factors present.
(2) Research has indicated that both ADHD and conduct disorders are strong predictors of violence in youth, and that 50% of young people referred for risk assessments have comorbid ADHD and conduct disorder (Salekin, Neumann, Leistico, DiCicco, & Duros, 2004). These young people are associated with earlier difficulties in childhood, and greater family adversity factors. Therefore, it was hypothesised that having co-morbid conduct disorder and ADHD would be associated with

more severe violence in young people who have been referred to a child and youth forensic mental health service, and that this would also be associated with significantly greater levels of early behaviour difficulties, antisocial histories, and family adversity.

(3) It was hypothesised that one of the distinct clusters would include young people with developmental disorders including PDDs, ASD, and/or intellectual impairment, and that these young people would be generally isolated from their peers. Given that research has been inconclusive around the relationship between PDDs and violence (Bjorkly, 2009; Mouridsen et al., 2008), it was hypothesised that these young people with PDDs would have significantly lower rates of violence than young people diagnosed with conduct disorder.

Method

Participants

Data for this research were collected from 91 case files of young people who have been referred to the Child and Youth Forensic Outreach Service (CYFOS), Spring Hill for a violence risk assessment. CYFOS provides forensic mental health consultation for young people aged between 10 and 18 years who reside in the Central and Southern Area Health Districts of Queensland. The final sample varies in age at referral from 10 to 18 years ($M = 15.01$, $SD = 1.85$) and consists mainly of males (86.8%). Of the sample, 11% identified as Aboriginal and/or Torres Strait Islander (ATSI), 75.8% are Caucasian-Australian, 11% are from a Culturally and Linguistically Diverse (CALD) background, and 2.2% are of other ethnic origin.

Materials

The clinical case files that were accessed for the current study include a comprehensive risk-assessment tool completed by CYFOS clinicians including information on the young person's developmental, educational, family, and medical history, social and interpersonal functioning, and forensic and offending history. The assessment encompasses both static and dynamic risk factors associated with youth violence, as well as any protective or mitigating factors across the broad areas of school, peers, family, and community. As part of the assessment CYFOS clinicians complete a comprehensive mental status examination, as well as a diagnostic formulation, based on the International Statistical Classification of Diseases – Tenth Revision (ICD-10; World Health Organization, 2002).

To enable the standardised collection of information for the current study, a tailored coding instrument was developed. The instrument addresses the primary risk factors associated with youth violence and targeted violence in the empirical literature – as well as the inclusion of clear operational definitions for each of the key variables – to aid in the consistency of data collection. The coding instrument collects demographic information of participants (age, gender, ethnicity, accommodation), historical factors (early behavioural difficulties, history of antisocial behaviour, history of sexual and non-sexual violence, history of weapon use, childhood history of abuse, current and prior involvement with child protection services, serious criminal behaviour, family history of mental health disorders, antisocial family history, self-harm history, suicidal ideation history), social/contextual factors (peer relationships, bullying/peer rejection, substance use), and mental health diagnosis (presence of mental health disorder, comorbidity, and diagnosis classified in accordance with the ICD-10; World Health Organization, 2002). Each risk factor was rated dichotomously as being present or absent. Mental health disorders were rated as current diagnosis, past diagnosis, or no diagnosis recorded. Six cases were selected at random for rating by a second researcher for the purpose of inter-rater

agreement. The results of this are promising, with a 95% agreement rate between researchers on the rated items.

Results

Statistical Analyses

The Statistical Package for Social Sciences v21 (SPSS, IBM Corp, 2012) was used to screen and analyse the data. Prior to the analyses, the data were screened for data entry errors, coding errors, and missing values, with three missing values detected in the peer type variable. These cases were excluded from the cluster analysis and the chi-square test of contingencies. No other missing values were identified.

Cluster Analysis

Cluster analysis was used to investigate whether there are statistically reliable and meaningful subgroups within the sample of young people referred to CYFOS for violence risk assessments (Hair, Black, Babin, & Anderson, 2010). This technique is generally exploratory, and therefore the variables selected for the analyses need to be clinically relevant to the purpose of the cluster. Given that the current research includes both continuous and categorical variables, the two-step clustering procedure in SPSS was selected as the most appropriate clustering method for the data set. The hierarchical clustering method and k-means clustering method were both inappropriate for the current research, as these methods do not allow the inclusion of categorical variables. The selected categorical variables include: history of violence (yes minor, yes major, no), history of antisocial behaviour (yes minor, yes major, no), early behavioural difficulties (yes, no), peer association type (antisocial, isolated, pro-social), history of abuse and trauma (yes, no), and antisocial family (yes, no).

A two-step clustering procedure was employed using a fixed number of clusters. Three clusters were deemed to be the best fit for the data following multiple analyses with different combinations of cluster variables, as these three broad categories tended to emerge each time. Multiple runs indicated that the three-cluster solution is stable, as less than 20% of observations were assigned to a different cluster (Hair et al., 2010). The two-step clustering procedure yielded three different groups/clusters of young people in the final solution, successfully incorporating 88 of 91 young people (96.7%) into a cluster. The cluster quality was deemed satisfactory and considered a fair fit. Of the sample of 91 young people, 37.4% fall into cluster 1, 38.5% into cluster 2, and 20.9% into cluster 3. Three young people were excluded from the established clusters as they had missing values on the peer type variable.

The profiles of each of the three clusters were analysed. Cluster 1's mean age is 15.74 years ($SD = 1.29$) and it is comprised of 34 young people. The members of this subgroup are the oldest out of the three subgroups. This cluster comprises a subgroup of young people with less family adversity factors recorded than the other two subgroups, and generally consists of young people with limited or less serious antisocial and violence histories. The majority of the young people in this cluster had no recorded behavioural difficulties prior to the age of 10 years. The first cluster is labelled *generally non-violent* as it includes mostly young people who scored low on the majority of the risk factors. Cluster 1's lack of risk variables is important in differentiating it from the other two clusters.

Cluster 2's mean age is 14.17 years ($SD = 2.07$) and it is comprised of 35 young people. The cluster comprises a subgroup with serious violence histories how have committed serious antisocial acts and for whom there was an early onset of behavioural difficulties. The members of this subgroup are the youngest out of the three subgroups. Clinically this cohort is associated with a greater number of comorbid mental health disorders. Cluster 2 is labelled *early violence* as it includes high ratings on most of the risk

Table 1. Variable importance of the clustering variables for each cluster.

Cluster	Variable contributing to cluster membership
Cluster 1 *(Generally non-violent, $n = 34$)*	Early behavioural difficulties (low); history of antisocial behaviour (high proportion not reported, or only one or two incidents recorded); antisocial behaviour in family (relatively low); history of violence (high proportion not reported, or only one or two incidents recorded); peer association (high percentage isolated, or pro-social peers); abuse history (fewer than clusters 2 and 3).
Cluster 2 *(Early violence, $n = 35$)*	Early behavioural difficulties (high); history of antisocial behaviour (high proportion, with three or more incidents recorded); antisocial behaviour in family (high proportion); history of violence (highest, majority with three or more incidents of violence recorded); peer association (majority antisocial); abuse history (highest proportion).
Cluster 3 *(Later violence, $n = 19$)*	Early behavioural difficulties (none); history of antisocial behaviour (highest proportion, with three or more incidents recorded); antisocial behaviour in family (high proportion); history of violence (high proportion); peer association (greatest number of antisocial peers); abuse history (between clusters 1 and 2).

factors, and the most important differentiating factor is the early onset of behavioural difficulties.

Cluster 3 is the smallest of the three clusters, consisting of 19 young people with a mean age of 15.37 years ($SD = 1.34$). This cluster describes a subgroup with members who have engaged in serious violence and antisocial behaviour, and has a profile that closely resembles that of cluster 2. The final cluster is labelled *later violence* as the members of this group had limited early behavioural difficulties, suggesting a later onset of violence and aggression in this subsection of young people. Clusters 2 and 3 are both associated with high ratings on violence and antisocial behaviours, and multiple risk factors. The variable importance plots indicate that the most important variables contributing to cluster membership include the variables outlined in Table 1.

The results of the cluster analysis were followed up with a discriminant function analysis (DFA) as a measure of cross-validation of the three-cluster solution (Tabachnick & Fidell, 2007). The results indicate that the predictive accuracy for the three-cluster solution is quite high, with 76 out of the 88 young people (86.4%) correctly classified. The results indicate that in clusters 1 and 3, over three quarters of the cases are correctly classified (76.5% and 78.9%, respectively), and in cluster 2 all of the cases are correctly classified. To evaluate the level of agreement between the original cluster (cluster analysis) and the predicted cluster (DFA), a Kappa measure of agreement was calculated. The results indicate excellence agreement between the cluster analysis and DFA ratings, with a Kappa coefficient of .79 (Kaplan & Sacuzzo, 2013).

Follow up Analyses

Chi-square analyses and analyses of variance (ANOVA) were conducted to evaluate the between-group differences for personal, familial, social/contextual and mental health factors. The results of the analyses are displayed in Tables 2 and 3. Cluster 1 youth have significantly lower rates of weapon use,

Table 2. Chi-square values for personal, family and social/contextual variables by cluster membership.

Variable	Cluster 1 ($n = 34$) % Yes (n)	Cluster 2 ($n = 35$) % Yes (n)	Cluster 3 ($n = 19$) % Yes (n)	Chi-square
Weapon use history	32.4 (11)[a]	82.9 (29)[b]	78.9 (15)[b]	21.57***
Serious offending	8.8 (3)[a]	65.7 (23)[b]	57.9 (11)[b]	25.41***
Threat present	70.6 (24)[b]	25.7 (9)[a]	68.4 (13)[b]	16.45***
Pro-violence attitudes	64.7 (22)[a]	91.4 (32)[b]	89.5 (17)[b]	9.10*
Violent themes	44.1 (15)	45.7 (16)	52.6 (10)	0.37
Current child protection	8.8 (3)[a]	48.6 (17)[b]	15.8 (3)[a]	15.46***
Previous child protection	14.7 (5)[a]	62.9 (22)[b]	31.6 (6)[a]	17.42***
Exposure to violence	50.0 (17)[a]	77.1 (27)[b]	78.9 (15)[b]	7.30*
Alcohol use	23.5 (8)[a]	48.6 (17)[b]	68.4 (13)[b]	10.70**
Drug use	20.6 (7)[a]	60.0 (21)[b]	63.2 (12)[b]	13.87 ***
Family mental health	61.8 (21)	80.0 (28)	84.2 (16)	4.31
Mean age in years (*SD*)	15.74 (1.29)	14.17 (2.07)	15.37 (1.34)	$F = 8.22$*

Note: *$p < .05$; **$p < .01$; ***$p < .001$. Differing superscripts indicates significant between group differences. Significant figures are derived using χ^2 test of contingencies.

serious offending histories and pro-violence attitudes compared to the other two groups. Young people assigned to clusters 1 and 3 are significantly older and are more likely to have been referred for threat assessment compared to cluster 2 youth. Child protection involvement is significantly higher for cluster 2 youth, though elevated rates of exposure to violence are evident for both clusters 2 and 3 compared to cluster 1. Alcohol use is significantly higher for cluster 3 compared to the other two groups, and both clusters 2 and 3 have high rates of illicit drug use.

In examining mental health diagnoses, the cluster 2 youth present with significantly higher rates of comorbidity, disruptive behaviour disorders, and attachment disorders. The difference for the remaining disorders, including PDDs, is not significantly different between the three groups.

Table 3. Chi-square results for mental health diagnosis by cluster membership.

Variable	Cluster 1 ($n = 34$) % Yes (n)	Cluster 2 ($n = 35$) % Yes (n)	Cluster 3 ($n = 19$) % Yes (n)	Chi-square
Mental health disorder	85.3 (29)	100.0 (35)	84.2 (16)	5.83
Comorbidity	35.3 (12)[a]	71.4 (25)[b]	47.4 (9)[a]	9.26**
Developmental disorder	38.2 (13)	40.0 (14)	26.3 (5)	1.08
Conduct disorder/ODD	8.8 (3)[a]	74.3 (26)[b]	42.1 (8)[a]	30.33***
Mood disorder	35.3 (12)	31.4 (11)	26.3 (5)	0.46
Attachment disorder	0.0 (0)[a]	48.6 (17)[b]	21.1 (4)[a]	22.50***
Personality disorder	8.8 (3)	14.3 (5)	0.0 (0)	3.05
Hyperkinetic disorder	8.8 (3)[a]	65.7 (23)[b]	36.8 (7)[a]	23.82***
Anxiety disorder	32.4 (11)	40.0 (14)	26.3 (5)	1.10
Psychotic disorder	14.7 (5)	17.1 (6)	21.1 (4)	0.35

Note: *$p < .05$; **$p < .01$; ***$p < .001$. ODD = oppositional defiant disorder. Differing superscripts indicates significant between group differences. Significant figures are derived using χ^2 test of contingencies.

Discussion

The primary aim of this research is to examine the key demographic, historical, and clinical characteristics of a sample of youth with co-occurring mental health and offending behaviours in order to assess whether there are distinct groups or clusters of young people that share common a profile. Using cluster analysis three distinct subgroups were found among young people who were referred for violence risk assessments. The results support the possibility of different pathways towards offending and violence in youth, and are consistent with other research that has identified different subgroups of juvenile offenders based on their risk profiles (Mulder et al., 2010).

Cluster 1 represents young people referred for threat assessments who do not have many of the characteristic risk factors associated with violence. This cluster comprises a subgroup with less risk factors for violence and offending than the other two groups, and young people in this subgroup are more likely to have either no history or only a history of minor incidents of violence and antisocial behaviour. They are significantly less likely to have a history of serious criminal behaviour and antisocial attitudes that are supportive of violence. Notably, this group is significantly more likely than cluster 2 to present with concerns of targeted violence, demonstrating that young people do not necessarily have to have significant violent histories to present as a threat. As such, this provides support for the notion that using general violence risk assessments for young people who present with targeted violence is likely to be problematic, as this may overlook young people who do not have significant violence histories (Borum, 2000).

Cluster 2 signifies the largest group, representing many of the risk factors that have been previously identified in the literature as being associated with youth violence and offending (Farrington, 1991, 1995; Moffitt, 1993, 2006; Mulder et al., 2010; Stouthamer-Loeber et al., 2001; Zingraff et al., 1993). Notably, the young people in this group are significantly younger than those in the other two subgroups, consistent with the early onset of violence and delinquency. All of the young people in this subgroup had behavioural difficulties prior to the age of 10 years, which differentiates them from the young people in cluster 3. These findings suggest similarities to Moffitt's (1993) developmental typology which distinguishes between early and later onset conduct problems. This subgroup is most consistent with the early starter or life course persistent subtype, and has been associated with greater instability and dysfunction in the family, adversity, and early behavioural difficulties (Moffit & Caspi, 2001).

Cluster 2 is characterised by multiple risk factors in childhood, including exposure to violence, child abuse and neglect, serious criminal behaviour, and more serious acts of violence committed, all of which are associated with greater levels of violence (Borum, 2000; Farrington, 1995; Mulder et al., 2010; Stouthamer-Loeber et al., 2001; Zingraff et al., 1993). There are significantly higher levels of mental health comorbidity in this subgroup, with higher rates of conduct disorder, ADHD, and attachment disorders. As hypothesised, young people with a greater number of risk factors such as comorbid ADHD and conduct disorder are associated with greater violence.

Interestingly, cluster 3 has higher levels of alcohol use than the other two clusters. This may be explained by the older age of the young people in this group when compared to those in cluster 2, along with engagement with antisocial peers, which likely has an influence on alcohol use. Specifically, adolescence places youth at an increased risk of engaging in risky behaviours, such as substance misuse and delinquency. As such, intervention targeted towards these specific risk factors – such as substance use and offending peers – may be necessary. The principal distinction between clusters 2 and 3

is the difference in early behavioural difficulties. Cluster 3 has no reported early behavioural difficulties, which is similar to Moffitt's (1993) adolescence limited offenders or late starters. This subtype is typically bound to adolescence and has weaker correlations with negative family factors. This typology is also associated with negative social learning factors, including antisocial peers, which is consistent with the current findings indicating that most of the young people had antisocial peer affiliations. This cluster also had less exposure to child abuse and neglect, which may indicate a more stable home environment with less family adversity factors, which is often associated with individuals with a later onset of delinquency (Moffitt, 2006).

In contrast to predictions, there are no significant differences between the groups in diagnosis of PDDs. Furthermore, there are no significant differences found in rates of mood disorder, anxiety disorder, psychotic disorder, developmental disorder, or personality disorder. This may be due to the high levels of comorbidity found in young people referred for risk assessments and the diagnostic system in which numerous diagnoses are recorded. The current research collapses both past and current diagnoses into the one category to overcome small cell sizes, making it difficult to distinguish between current and past disorders. Future research should attempt to analyse primary diagnoses using larger samples to determine if any of these mental disorders distinguish young people based on their risk profiles.

Implications

The findings of the current research project have implications for service provision in the area of child and youth offending. Information based on the cluster classification identifies the needs associated with these young people, and provides the opportunity to focus on these specific needs through targeted treatment planning. The current study suggests that there are different groups of young people referred for violence risk assessments with very different treatment needs, and thus one type of intervention is unlikely to meet the needs of all individuals. Therefore, treatment should consider the Risk-Needs-Responsivity (RNR) model (Andrews & Bonta, 1995) in determining the level of intensity of the intervention for each young offender. The RNR model suggests that the level of intervention should match the individual's risk level and criminogenic needs, and that more intensive interventions are required for those who have a higher risk (Andrews & Bonta, 1995).

In considering the RNR model in relation to the current research findings, cluster 1 has less historical, contextual and clinical risk factors and would require a lower level of intervention compared to the other two clusters. Accordingly, the focus of intervention for this group may include early intervention and preventative methods rather than more intense rehabilitation methods. In contrast, young people in both clusters 2 and 3 would require more intense levels of intervention, in accordance with the RNR model (Andrews & Bonta, 1995). Interventions may need to address a broad range of problems, including substance misuse, comorbid mental health, offending behaviour, violence, and antisocial attitudes. The young people in these two clusters have greater than expected pro-violence attitudes, therefore intervention may focus on addressing cognitive distortions and maladaptive cognitions that may facilitate and support violent behaviour (Day & Daffern, 2013).

Given the high rate of family adversity found in these subgroups, interventions should consider targeting family factors, which may include a focus on improving parenting practices, along with the monitoring of young people. For individuals in cluster 2, given that research has identified a large number of risk factors in young people with early onset conduct disorder increasing the risk of violence and offending (Moffitt, 2006), intervention is necessary to try to prevent later

difficulties. Therefore, mental health clinicians should consider implementing preventative interventions when young individuals are referred to mental health services early in their developmental trajectory (Pardini & Frick, 2013).

Limitations and Future Directions

A number of methodological limitations are present in this study, including the small sample size and non-random sampling method, which limits the generalisability to populations outside of CYFOS. Given the specialist nature of the risk assessments conducted by CYFOS, it was not possible to use a randomised sample for the current study. This research should be compared with characteristics in other areas of Queensland and Australia to compare results and identify any distinguishing features.

Another limitation is the assumption that if data were not recorded in the CYFOS case file then it was not present or not an issue for the young person. This may result in an underestimation of some of the results that were found. Although the same methodology has been utilised in previous studies (e.g. Withington, Olgivie, & Watt, 2013), the prevalence of some risk factors may have been underestimated. The current study utilises case reports rated by different CYFOS clinicians, which may impact on the objectivity of the ratings. Furthermore, the majority of the items in the current research are rated solely by one researcher, though the reliability check supports the accuracy of ratings. A further attempt to address this limitation is the development of a comprehensive coding tool that includes operational definitions and examples of each item to assist in the reliability and consistency of data collection.

There are some limitations relating to the use of the cluster analysis procedure. Cluster analysis is a largely exploratory and descriptive analysis used to identify subgroups, and it is generally recommended that researchers should seek convergent evidence to support any identified clusters. While a three-cluster solution was found as the best fit for these data, the fit of the data is only fair. As a result, further validation and replication of this three-group solution is required with additional samples of young people. Future research should look at comparing the results of this study with clusters derived from a different sample using similar predictor variables.

The current research does not look at protective factors for the young people that decrease the likelihood of violence. This is an important area that has previously been examined by other researchers in the area of violence risk assessment. Future research could examine whether the three clusters identified differ in terms of the number of protective factors present. It is anticipated that cluster 1 would have more protective factors present than the other two clusters.

Despite the above limitations, these findings have contributed to a greater understanding of the demographic, historical, and social contextual factors of youth violence in an Australian sample. Given the high levels of mental health disorders, trauma, and risk factors in this population, these young people appear to have very specific mental health and offending needs. The current research indicates that young people referred for violence risk assessments are not a heterogeneous population and are likely to have different risk factors and risk profiles. These results provide a greater understanding of the risk factors present in a sample of young people referred to a forensic mental health service, and have implications in terms of case management, treatment planning, and intervention. The findings highlight the complex needs that young people who are referred for violence risk assessment present with, and the need for further research in this area.

Acknowledgements

We wish to thank the Child and Youth Forensic Outreach Service, Queensland Health for their support with this study.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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